Indy Reader Chip Overview

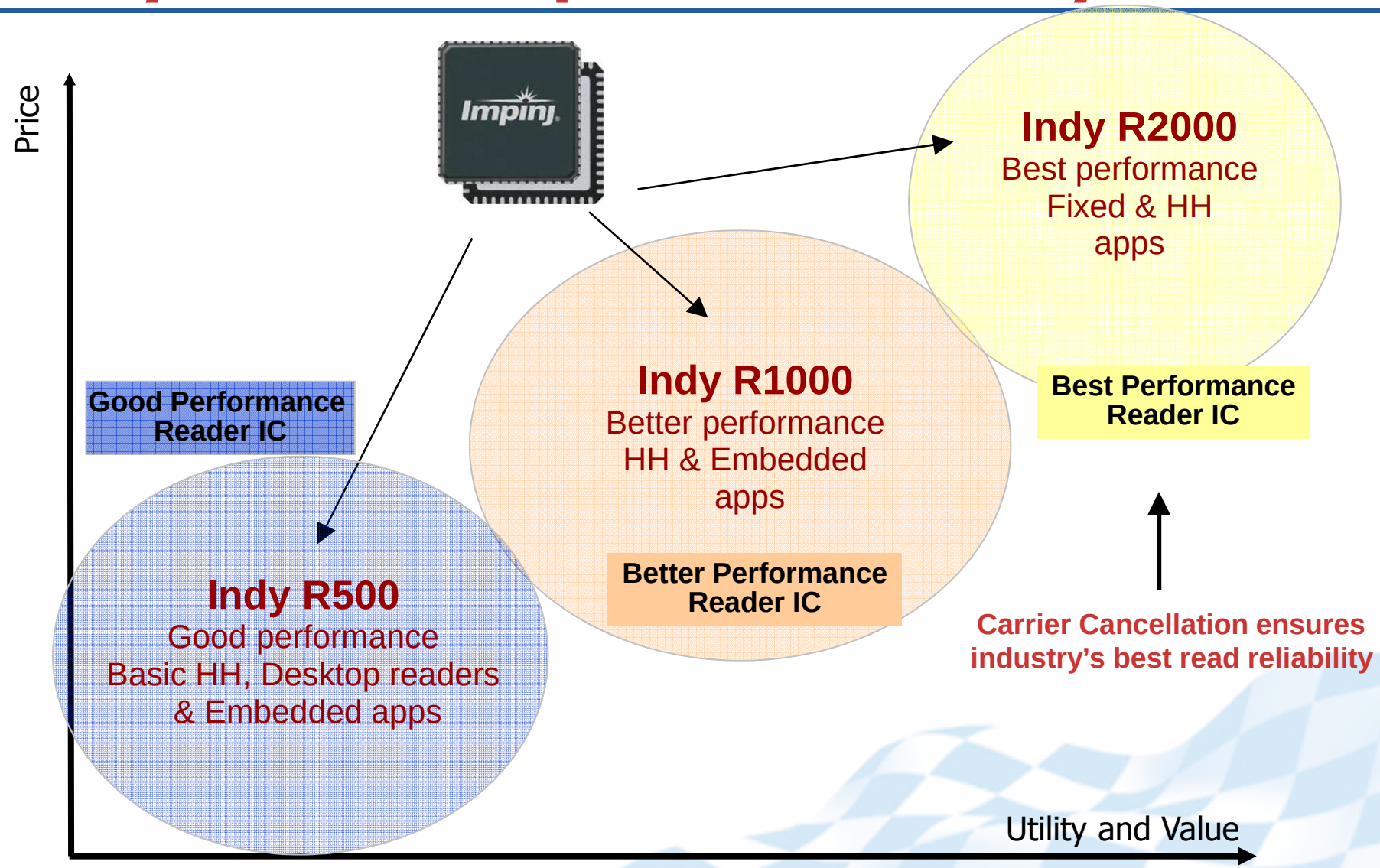
Q1 2012

Indy R500 – Ideal Embedded Reader Solution

- Low system and development cost
- Ease in obtaining product regional certification
- Pin compatible with R2000
- Industry-leading Technology

The Indy R500 adds a lower price/performance point to the industry leading UHF RFID reader platform

Indy Reader Chip Product Family



Good-Better-Best Covers Most Applications

Product	Fixed	Handhelds	Embedded
R500	Access control, desktop station	POS wand, short range Handheld	Coke dispenser, printers
R1000	Dedicated fixed readers for predictable read zones	Mid-range handheld	High speed printers / encoders
R2000	Performance fixed readers for challenging apps	Advanced Handhelds	High return loss, high tag count apps





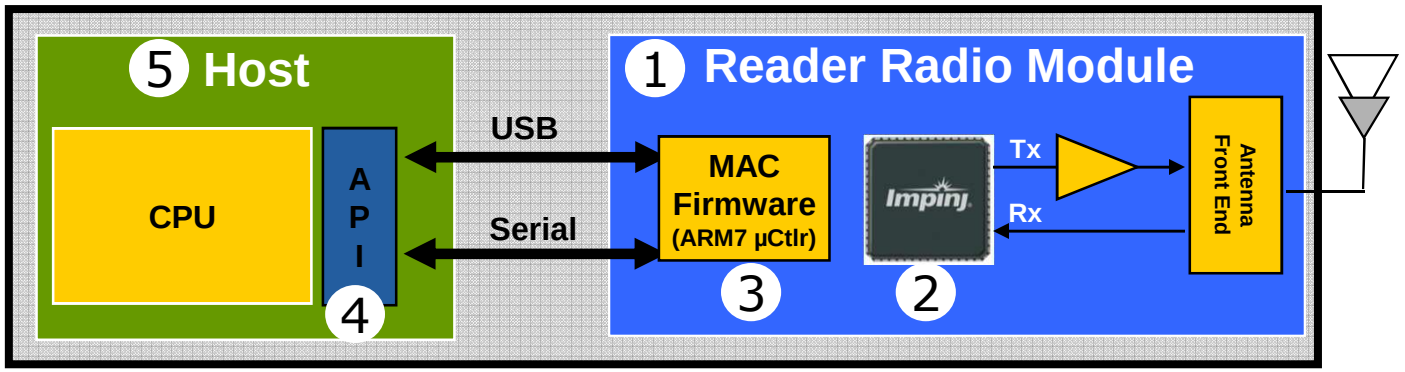

3 Reader Chips, 1 Platform

- **First Indy design provides technology core**
  - Reuse with multiple price/performance points to optimize product offerings
- **R2000, R1000 and R500 share**
  - Firmware/Software
  - Interface to Host
  - Host libraries
  - Development tools

- **R2000 & R500 are pin compatible, can be the same PCB**
  - R1000 requires a minor layout change

Inside an Indy Based Reader

RFID Reader



① **Reference radio module design**

Example design, not a finished product

② **Indy Reader Chip**

③ **MAC Firmware** (Atmel MC - AT91SAM7S256)

Gen2 protocol, radio control, digital host interface

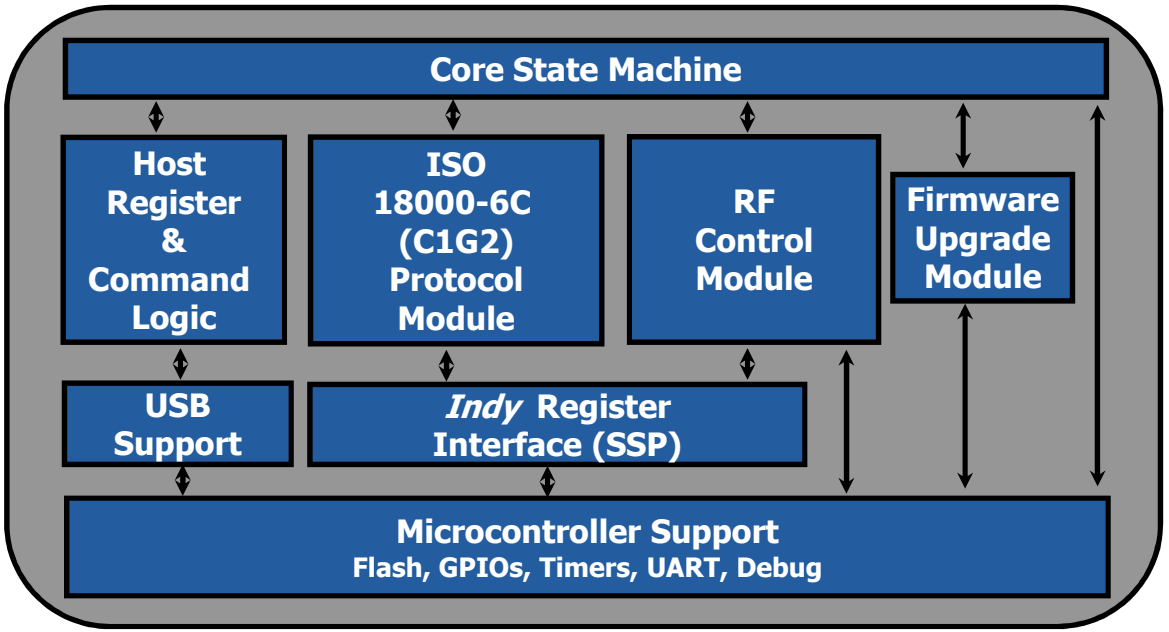
④ **Radio drivers and API library**

RFID specific function calls (library)

⑤ **Host – Another controller or PC**

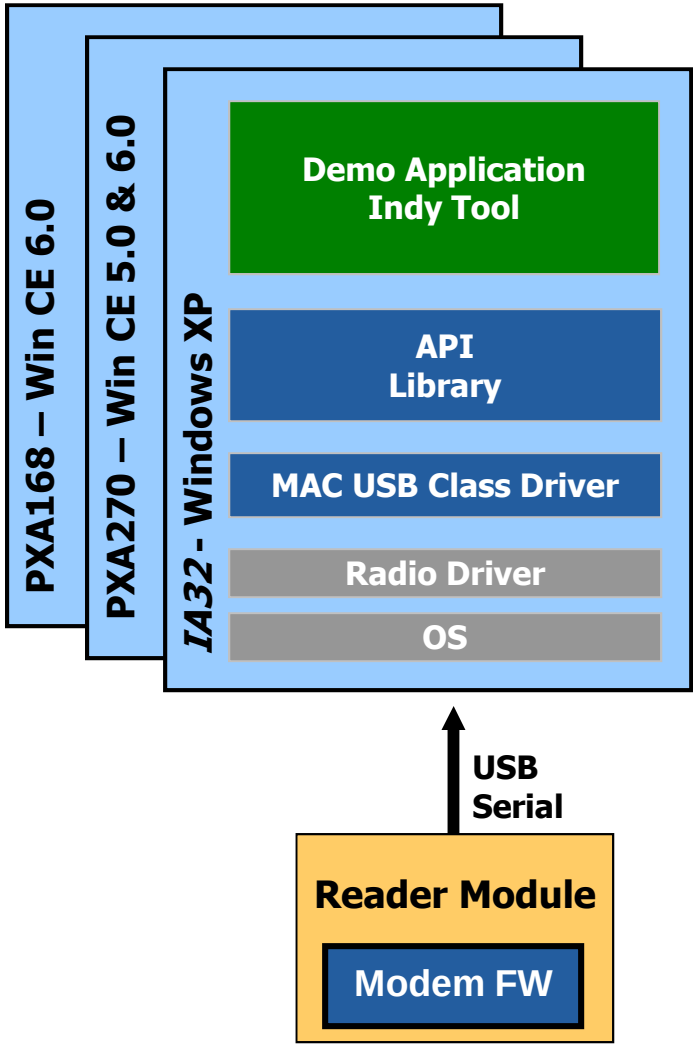
We support most common platforms

Inside the ARM7 Controller - Modem



- No operating system
- Firmware controls all aspects of the reader modem per Gen2 protocol
- Register based interface to the host

Host Drivers/API Support Common Platforms



- Support for IA32, PXA270, PXA168
- Support for WinCE*, WinXP*
- Programming library and USB class driver
- Sample application code
  - Tag inventory
- Demo GUI application
  - Demonstrates Indy performance and features
  - Demonstrates programming model
  - Windows XP only

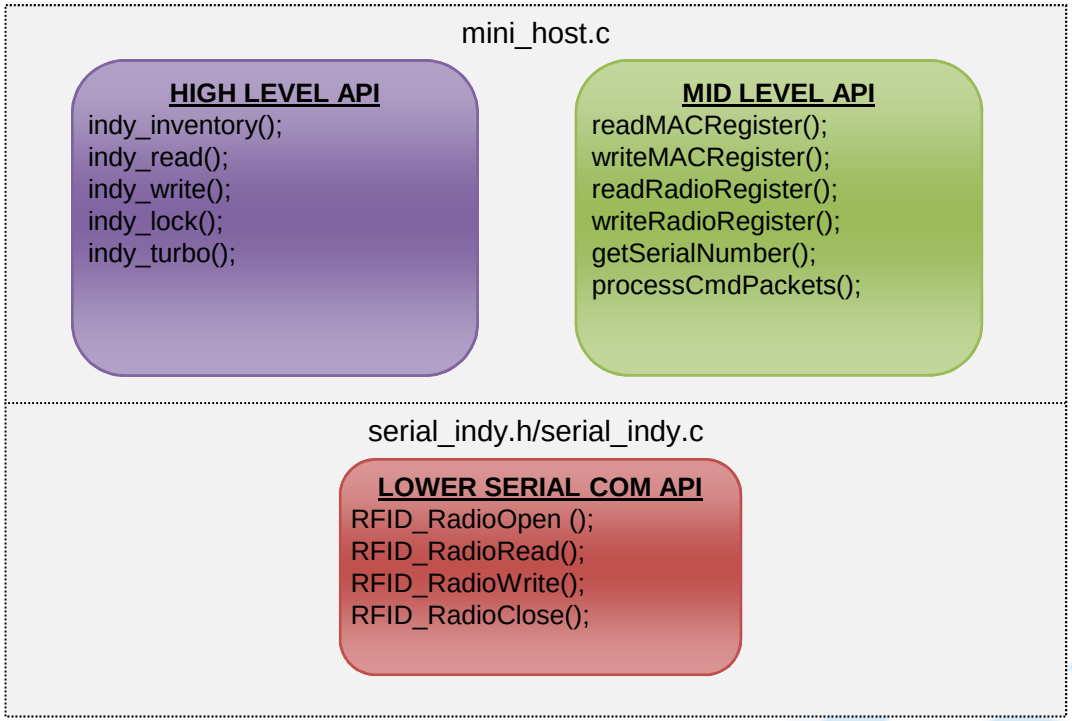
SDK Components

- RFID core components developed by Impinj
- Eval tools/collateral developed by Impinj
- Generic 3rd party components

*Other names and brands may be claimed as the property of others

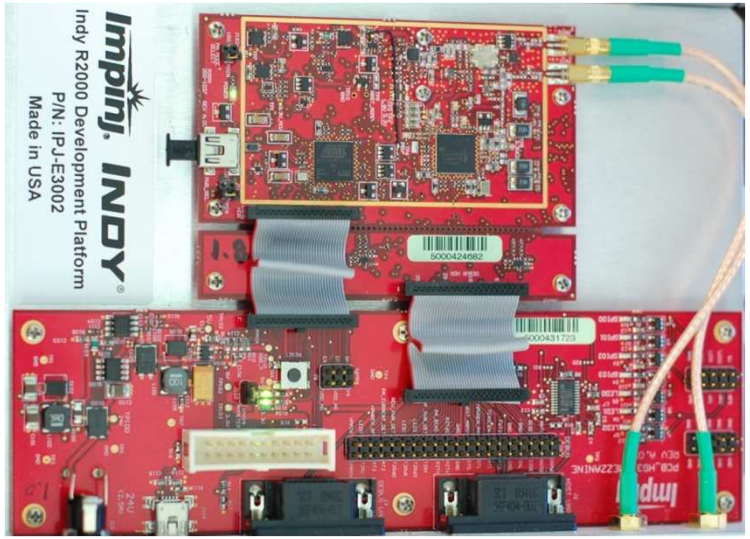
Mini-Host for Simple Host Operation

- **Mini-Host**
  - UART interface
  - Basic building blocks (Interface description)
  - Simple samples in C (simplified version from our SDK library)



Indy Development Platform

Module-like reference design



Interface/debug board

Kit Includes:

- Reader board
- Interface/debug board
- Housing
- Documentation
- Schematics
- Firmware binary
- 10 chips

Module-Like Reference Design

- **USB or UART serial interface**
- **30dBm output power**
- **USB powered (23dBm output power)**
- **Antenna configurations**
  - 2 mono-static or 1 bi-static
- **High performance 5th order external DRM filter**
  - Internal and external switches enable multiple mode operation
- **Schematics/layout files included**

Popular Indy Enabled Readers

Motorola FX7400

Kathrein RRU4

ThingMagic M6

CAEN R4300

Alien 9650

Deister UDL500

Indy Enabled Handhelds

Psion Workabout Pro

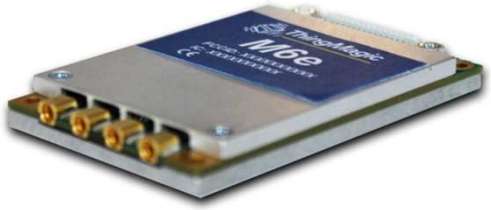
Technology Solutions UK

Motorola MC309z & MC9090z

CSL CS501

ATID AT870

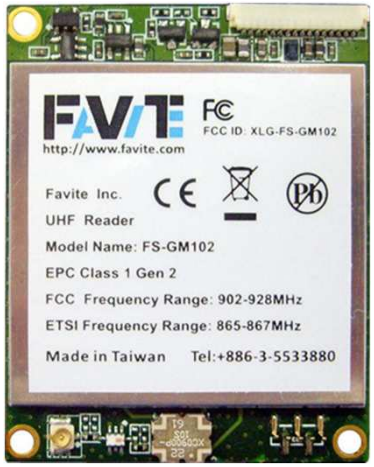
Popular Indy Enabled Modules



ThingMagic M6e

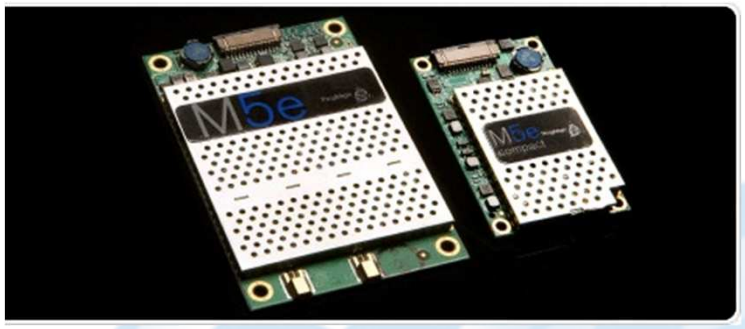
Powered By Impinj

MTI RU-859/860



Favite FS-GM102

CAEN A528



ThingMagic M5e & M5compact

Firmware Update

Indy Firmware 2.4.2

- Fail Safe Boot-loader
- Win CE 6.0 Support
- Advanced Monza Features
- Japan LBT Support

Firmware 2.4.2 adds valuable real-world features to the worlds most deployed UHF RFID reader platform

Fail Safe Boot-loader Adds Reliability

- **Robust recovery during firmware update**
  - Enables robust operation
  - Enables reliable remote upgrade capability
- **Leveraging existing interfaces**
  - USB/UART
  - Same packet interface as current architecture
  - Does not require additional HW
- **Fail Safe Boot-loader is easier to use**

Indy + Monza Are Better Together

- **FastID™ (Reads TID up to 2-3 times faster)**
  - Read EPC and TID in one operation
  - Lowers cost and complexity for TID-only applications
- **TagFocus™**
  - Improves read reliability with large tag populations
  - Greatly improves ability to read difficult tags
  - Reduces multiple reads of the same tag
- **32-bit BlockWrite**
  - Improves throughput during encoding operations
- **Enables QT™ operation with Monza 4**
  - Protects business sensitive data with private/public modes
  - Read range control
  - EAS implementation

A Full Range of Performance Options

Product	Read Rates	Tx Phase Noise	Rx Sensitivity
R500	Up to 180 tags/sec	-126dBc/Hz	-68dBm Rx sensitivity in most applications
R1000	Up to 600 tags/sec	-116dBc/Hz	-75dBm Rx sensitivity in most applications (-93dBm native)
R2000	Up to 800 tags/sec	-126dBc/Hz	-85dBm Rx sensitivity in most applications (-93dBm native)